

ABSTRACT

A device is provided, having an anode, a cathode, and a first organic layer disposed between the anode and the cathode. The first organic layer comprises a material that produces phosphorescent emission when a voltage is applied between the anode and the cathode. A second organic layer is disposed between the first organic layer and the cathode. The second organic layer is in direct contact with the first organic layer. The second organic layer may comprise an aromatic hydrocarbon material, comprising an aromatic hydrocarbon core optionally substituted, and wherein the substituents are the same or different, and each is selected from the group consisting of alkyl, aryl, heteroalkyl, substituted aryl, substituted heteroaryl and heterocyclic groups. The second organic layer may comprise a material having a dipole moment less than about 2.0 debyes, such that the device has an unmodified external quantum efficiency of at least about 3% and a lifetime of at least about 1000 hours at an initial luminance of about 100 to about 1000 cd / m². The second organic layer may be in direct contact with the cathode, or there may be a separate organic layer between the second organic layer and the cathode.